Medicine in Perspective

Historical Reflections on the Changing Concepts of Disease

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ONE OF THE MANY ASPECTS that makes the reading of Hippocratic medicine so superbly interesting is the fact that the ancient Greek medical writer had practically no medical terminology. Medical nomenclature developed slowly and gradually, in pace with the gradual development of medical knowledge; and so long as medical knowledge was restricted, a narrative, descriptive style was used to evoke a picture of a disease, where nowadays one word, a simple disease name, would suffice. From a literary point of view the Hippocratic method of medical writing was eminently more pleasing. But it was satisfactory also from a medical point of view, for many of the ancient descriptions were so succinct and detailed that they presented as graphic a picture of the disease under discussion as can now be found in the most modern medical textbook. This is perhaps best illustrated by the reading of one short excerpt. It deals with a disease whose name I need not mention, but which will be recognized by everyone in all its detail and ramification.

"In Thasus, early in spring. . . . Many had swellings beside the ears, either on one or both sides, in most cases without fever, and not necessitating confinement to bed; some, however, were a little heated. In all cases these swellings subsided without giving trouble, and none went on to suppuration as do those from other causes. In character they were flabby, large, diffuse, without inflammation or pain; in all cases they disappeared without a sign. These conditions occurred in youths, young men, and adults; mostly in such as took exercise in the wrestling schools and gymnasia; but they seldom attacked women. Many had dry coughs without expectoration; and hoarseness in speaking. Not long after, but in some cases a considerable time later, painful inflammation occurred in one or both testicles; fever in some cases, in others not. The condition was as a rule very troublesome. In other respects they had no illnesses requiring medical attention."[1]

This passage gives emphasis to a phenomenon which is of great importance to our subject: The disease in question, mumps, is so well observed that it need not be named. It was described more than 2,000 years ago. And yet, it might be a description of a mumps epidemic of today. The same is true for most other diseases given in the Hippocratic writings. From this we must conclude that while in the nearly twenty-five hundred intervening years since the days of Hippocrates some diseases may have undergone slight changes or permutations, most of them have existed in their present form since the beginning of history. Thus, what is unchanged is disease. What did change, however, is the way in which disease was looked upon.

This change is twofold: first, it refers to the pathological, physiological and etiological concepts and hence also to therapy. And second, it refers to the social aspect of disease in general and of individual diseases in particular.

The distinction which we now make between disease in general and individual disease or disease entities is a very important one. It did not come about automatically, nor early in the history of medicine but was the result of long experience and increasing sophistication in medical thought. Thus, while some individual diseases were known and recognized fairly early in the evolution of medicine, they were not looked upon as distinct entities but rather as manifestation of a state of disease

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that affected the human body *in toto*. This is, of course, particularly evident in primitive cultures, where all aspects of disease—etiology, pathology and therapy—were related to superhuman influences. Gods, evil spirits, demons did not send a sore throat or appendicitis or a broken leg; they sent disease, a state of illness which attacked the body in general, although it might be manifest in one particular spot only. Conversely, to treat disease, the exponents of primitive medicine, the shaman, or medicine man, did little for the affected part of the body, but rather tried to appease the powers that had sent the disease. In doing so they acted entirely logically—even if not altogether rationally from our point of view. They avoided the treatment of the disease itself and went straight to the root of the evil, namely, to assuage the wrath of the powers that had caused it. With the appeasement of the superhuman powers by prayers, incantations and sacrifices, the manifestation of their anger—that is, the disease itself—was bound to disappear.

The eventual divorce of medicine from superhuman connections was finally and clearly pronounced in the Hippocratic writings (fifth to fourth century B.C.) and finds succinct expression in the treatise on epilepsy, entitled:

"On the Sacred Disease"

"It is this with regard to the disease called *Sacred:* it appears to me to be nowise more divine nor more sacred than other diseases, but has a natural cause from which it originates like other affections. Men regard its nature and cause as divine from ignorance and wonder, because it is not at all like to other diseases. And this notion of its divinity is kept up by their inability to comprehend it. But if it is reckoned divine because it is wonderful, instead of one there are many diseases which would be sacred; for, as I will show, there are others no less wonderful and prodigious, which nobody imagines to be sacred."[2]

It is difficult to appreciate fully the impact and importance of this statement. It removed disease from the hazy spheres of the heavens and brought it down to earth and into the realm of the physician's responsibility. The physician's every act now became important and it was up to him, and no longer to the deities, to treat and cure the patient.

Of course, the removal of the gods from the concept of disease necessitated the formation of new frameworks of thought for the cause and the cure of illness. Since it was no longer the deities whose pleasure maintained the harmony of the human body and whose displeasure caused disharmony and disease, other bases for harmony and disharmony had to be found. The first of these bases was known as humoral pathology; it was the theory of the harmony or disharmony of the four elementary substances, the four humors (yellow bile, black bile, phlegm, and blood). The preponderance of each of these led to either the choleric, melancholic, phlegmatic, or the sanguine personality type. Another theory of health and disease was that of the so-called solid pathology of the atoms, the solid minute particles whose harmony—that is, whose even distribution and free flow—maintained health and whose stagnation or plethora caused disease and death.

Thenceforth, the scholarly physicians of Greece and of the later Graeco-Roman period distinguished illnesses not so much by their location and manifestation as by their supposed cause, whether a preponderance or lack of one of the four humors or an exaggerated constriction or relaxation of the atoms. Translated into practice, this meant that the physicians who believed in the pathology of solids gave constricting or relaxing remedies as the case might require (following the maxim of *contraria contrariis*). Those who adhered to the concept of humoral pathology attempted to supplement the deficient humor by related foods or to combat the superabundant humor by foods with opposing properties. Together with these measures, however, which were directed to the theory of disease, the physicians also attempted relief of the symptoms which actually represented the individual illness.

The medical theorists in Greece, that is, those who saw the cause of disease in dyscrasia of humors or an imbalance of atoms, maintained their point of view well into the first centuries of our era, and, indeed, the humoral theory continued to persist until the rise of modern medicine. Not only for physical disease was humoral imbalance considered responsible, but also in the attitudes toward mental health and disease this theory played an important role. The melancholic person in whom black bile *(melas cholé)* predominated, the choleric who was full of yellow bile, the sanguine person and the phlegmatic became prototypes of personality and behavior—often found in the plays of Shakespeare—and have remained so ever since.

Disease as the Work of Witches

The spirit peculiar to the Middle Ages, however, re-introduced a concept of disease that was strongly reminiscent of primitive medical thinking. Again a punishing deity began to send disease to chastise humanity with epidemics of a vast variety and unsurpassed severity—particularly the Black Death, that is, the plague. And again mankind attempted appeasement of the offended deity by means of prayers, fasting and incantations. Thus once again the practice of medicine was shared by the priest. Of course, a great many of the medieval monks were trained in the practice of medicine, and they could give medical care, as well as spiritual. But it was largely the pure cleric, not the medically trained monk, who gave medieval medicine its superhuman stamp.

Perhaps the best example for this removal of all physical considerations from the realm of medicine can be found in a work that was actually composed during the Renaissance, but which is unsurpassed as a prototype of medieval reasoning. This work, the *Malleus Maleficarum*[4]—the "Witches' Hammer"—stemmed from the pen of two Dominican monks, Johann Sprenger and Heinrich Kraemer, who had been appointed Inquisitors of Northern Germany by Pope Innocent VIII. Fortified by a Papal Bull of 1484, these two men composed a work in which any mental and physical aberration from the norm was ascribed to deviltry, witchery and evil. The volume became the guidebook for the Inquisition and went through nearly 20 editions within two centuries. The latest edition (of 1928) rendered it into English.

The "Witches' Hammer" is divided into three parts. The first is devoted to the proof of the existence of witchcraft, the second presents "clinical reports" of the manifestation of the various types of witches, and the third deals with legal aspects of establishing and sentencing witchery. In the course of the Middle Ages the differentiation between the mentally sick, the witch and the heretic had become less and less sharply defined; and in the 13th century they were considered synonymous by most persons. Eventually, however, all diseases came into the realm of witchery. This can be illustrated by the following statement emanating from the pen of a member of the Inquisition.

"There is no part in our body that they [the witches] would not injure. Most of the time they make the human being possessed and thus they are left to the devils to be tortured with unheard of pains. They even get into carnal relations with them. . . . Unfortunately, the number of such witches is very great in every province; more than that, there is no locality too small for a witch to find. Yet Inquisitors and Judges who could avenge these open offenses against God and Nature are so few and far between. Man and beast die as a result of the evil of these women and no one thinks of the fact that these things are perpetrated by witches. Many suffer constantly of severest diseases and are not even aware that they are bewitched."

What, specifically, were the types of diseases that were removed from the responsibility of the physicians and put into the domain of religion? The "Witches' Hammer" enumerates them explicitly. The devil — or the witches — "have six ways of injuring humanity. And one is, to induce an evil love in a man for a woman, or in a woman for a man. The second is to plant hatred or jealousy in anyone. The third is to bewitch them so that a man cannot perform the genital act with a woman, or conversely a woman with a man; or by various means to procure an abortion. The fourth is to cause some disease in any of the human organs. The fifth, to take away life. The sixth, to deprive them of reason." *(Malleus Maleficarum,* p. 115)

It is clear that this listing comprises a very large part, if not most, of medicine, but some diseases are mentioned specifically for their demonic origin. Even the righteous monks felt that a special explanation was needed to make this plausible. The following is only one of many such examples.

And, ". . . although greater difficulty may be felt in believing that witches are able to cause leprosy or epilepsy, since these diseases generally arise from some long-standing physical predisposition or defect, nonetheless it has sometimes been found that even these have been caused by witchcraft." And then they give an example.

"For in the diocese of Basel, in the district of Alsace and Lorraine, a certain honest laborer spoke roughly to a certain quarrelsome woman, and she angrily threatened him that she would soon avenge herself on him. He took little notice of her; but on the same night he felt a pustule grow upon his neck, and he rubbed it a little, and found his whole face and neck puffed up and swollen, and a horrible form of leprosy appeared all over his body. He immediately went to his friends for advice, and told them of the woman's threat, and said that he would stake his life on the suspicion that this had been done to him by the magic art of that same witch. In short, the woman was taken, questioned, and confessed her crime.

But when the judge asked her particularly about the reason for it, and how she had done it, she answered: 'When that man used abusive words to me, I was angry and went home; and my familiar [advisor, the Devil] began to ask the reason for my ill humor. I told him, and begged him to avenge me on the man. And he asked what I wanted him to do to him; and I answered that I wished he would always have a swollen face. And the devil went away and afflicted the man even beyond my asking; for I had not hoped that he would infect him with such sore leprosy.' And so the woman was burned."

This is only one of many similar examples.

Monks' Thoughts on Women

It is interesting that most of the victims of witchery were men, and that there were vastly more witches than wizards in the mental world of the Middle Ages and the two Inquisitors. While almost any known disease was described, and ascribed to witchery, the disturbances encountered most frequently relate to the reproductive organs. Sexual disorders, impotence and perversion, delusions of the loss of sexual organs occur with remarkable frequency. In view of the fact that the authors were monks and subordinate to the laws of celibacy, their preoccupation with these subjects is quite remarkable. Even more so, perhaps, is their attitude toward women, who, they felt, by their very nature, were disposed to enter into a compact with the devil. It almost appears as if they considered the state of femaleness a disease itself, when they exclaimed:

"What else is woman but a foe to friendship, an unescapable punishment, a necessary evil, a natural temptation, a desirable calamity, a domestic danger, a delectable detriment, an evil of nature, painted with fair colours! Therefore, if it be a sin to divorce her when she ought to be kept, it is indeed a necessary torture; for either we commit adultery by divorcing her, or we must endure daily strife."

Thus, women, inferior by nature, lying, vicious and hopelessly impure, are naturally the most serviceable and most willing tool of the devil. The *Malleus* supports its misogynous contentions by way of another characteristic excursion into infantile philology—the alleged derivation of the Latin word for woman, *femina;* the word is supposed to come from *fe* and *minus* (without faith), the latter designating a defect in nature. Woman is also proved to be constitutionally inferior, because

". . . it should be noted that there was a defect in the formation of the first woman, since she was formed from a bent rib, that is, a rib of the breast, which is bent as it were in a contrary direction to a man. And since through this defect she is an imperfect animal, she always deceives."

The digression into the *Malleus Maleficarum* has served to illustrate the concept of disease as it was held by many of the clergy during the Middle Ages and even the Renaissance. While these men were probably altogether representative of medieval attitudes toward mental illness, there were a few other more enlightened healers, as well as a great many lay physicians who attended to man's *physical* diseases.

What were their concepts of disease? As was mentioned earlier, it was the humoral concept that persisted for more than a millennium. But the dyscrasia of humors was not too satisfactory an explanation for the rise and spread of medieval epidemics, such as leprosy, the plague, St. Anthony's fire (ergotism), the English sweating sickness and others of equally devastating nature. Nor was it sufficient to explain the existence of syphilis, the new scourge of the Renaissance.

A Tardy Understanding of Contagion

From our modern point of view it seems difficult to understand that the phenomenon of contagion was not recognized with the appearance of the first contagious disease. Yet, even as keen an observer as the author of the Hippocratic description of mumps failed to see why it was the men who congregated in gymnasia who contracted the disease while the women who stayed at home in relative isolation remained free from it. In the absence of a recognition of contagion, all sorts of other explanations were sought to account for the spread of disease. Foulness of the air, as in the case of malaria *(mal aria),* swampy exhalations in the form of miasma, artificially poisoned water and other imaginary causes gained firmly convinced adherents. In consequence, treatment was also geared to these hypothetical causes. Protection from the foul air was sought by means of perfumed sponges, windows were kept closed to keep out the miasma, and the pogroms against Jews (and others suspected of evil intentions) were held to prevent the alleged poisoning of wells.

Personal contact was feared only in the case of leprosy. Whether this was so because of the well-known biblical injunctions in Leviticus XIII, or because the disease in its medieval form was of a

more contagious nature than we know it now, will never be known. Nor will we ever know whether the many outcasts diagnosed as lepers by non-medical authorities were actually sufferers from what later became more precisely defined as Hansen's disease.

The first truly modern biological concept entered medical thinking only with the earliest clear statement on the existence of contagion. This came into being amazingly late if we consider the clear disease pictures of the earlier days. After all, Hippocrates' description of mumps contained a clear picture of a contagious disease which was contracted by the men who gathered in the gymnasia but more rarely by the women who spent their days in the seclusion of their homes. The first clear statement of contagion was pronounced by Girolamo Fracastoro (1478-1553) of Verona, a true Renaissance personality who was at the same time a physician, a poet, a physicist, an astronomer and a pathologist. He is best known for his medical poem on syphilis, *Syphilis sive morbus gallicus* (Venice, 1530).[4] In this poem he coined the name of the disease and stressed its venereal cause. More important, however, is his treatise on contagion which was published in 1546. Here we find the first clear statement concerning the existence of microorganisms *(seminaria contagionum),* capable of reproduction in appropriate media. To be sure, Fracastoro did not think of these imperceptible particles whose existence he divined but could not prove, as living organisms *(contagia animata)* but we must consider that his work was done as early as 1530 and without the help of a microscope, in fact centuries before it was even invented. When we consider that Fracastoro worked solely on the basis of logical deduction, we must read in awed admiration his definition of contagion

"If we allow ourselves to sketch a sort of tentative definition of contagion, we shall define it as: A certain precisely similar corruption which develops in the substance of a combination, passes from one thing to another, and is originally caused by infection of the imperceptible particles.

"In what follows they are called [*seminaria contagionum,* seeds or] 'germs of contagion.'

"There are, it seems, three fundamentally different types of contagion: the first infects by direct contact only; the second does the same but in addition, leaves fomes [fomites], and this contagion may spread by means of that fomes [fomites] — for instance, scabies, phthisis, bald spots, elephantiasis and the like. By fomes I mean clothes, wooden objects, and things of that sort, which though not themselves corrupted can, nevertheless, preserve the original germs of the contagion and infect by means of these; third, there is a kind of contagion which is transmitted not only by direct contact or by fomes as intermediary, but also infects at a distance; for example, pestilent fevers, phthisis, certain kinds of ophthalmia, exanthemata of the kind called variolae, and the like. These different contagions seem to obey a certain law."

It is not surprising that so revolutionary a doctrine failed to catch the imagination of Fracastoro's contemporaries. Indeed, it altogether failed to make a decisive impact on medicine until the 19th century, when the theory of microorganism could be substantiated by scientific measurements and apparatus.

Instead, the medical scientists of the centuries that followed the Renaissance persisted in the search for general laws by which to explain the phenomenon of health and disease. In keeping with the scientific movements of the 17th century, the interest of the physicians was drawn either toward the mathematical and physical discoveries of men such as Copernicus, Kepler, Galileo and Newton or toward the work of chemists such as Boyle, Willis and Mayow. Depending on the bent of their interest, they began to explain all bodily function and dysfunction either on mathematical or chemical principles and became known as Iatro- (from the Greek *iatros* = physician) physicists (also known as Iatromathematicians) or as Iatrochemists.

The "Sensitive Soul" Theory of Disease

As was to be expected, these two materialistic and mechanistic theories gave rise to a third, equally speculative but much more abstract, school of thought which began as "animism" and ended as "vitalism." It was conceived by Georg Ernst Stahl (1660-1734), a German who saw the "sensitive soul" as a source of all vital phenomena. Disease was a disturbance of the vital functions caused by the faulty activity of the soul. In fact, Stahl himself was a victim of this: he died in deep melancholia.

The idea of the soul as the source of life, as a regulator of physical function, and as a cause of pathological processes was immensely appealing to Stahl's contemporaries and successors. This idea can also be found in the writings of Barthez (1743-1806) of Montpellier, who coined the term "vital principle." It can also be found in the *élan vital,* by the philosopher Henri Bergson.

Even in the writings of Marie-Francois Xavier Bichat (1771-1802) this principle can be found. Bichat was the creator of descriptive anatomy and the founder of the field of histology. He examined the tissues of the body, unaided by the microscope, and defined 21 varieties of tissue. So far, he was a pure scientist, but then he concluded that each of the 21 tissues had its own specific vital property which made the tissue viable and gave it its specific character. Bichat, like the vitalists before him, regarded disease as an alteration of vital properties or principles. His definition of life, from which scientists still take an answer today, was "the sum of forces that resist death."

Perhaps it was not too astonishing that the somewhat mystic idea of vitalism persisted longest in Germany and had its most recent representative in the person of Hans Driesch in the early 20th century.

Vitalism, of course, is in conflict with science, with its search for measurable and demonstrable facts. Therefore, there is now no patience with or room for immeasurable or undemonstrable functions of the soul. Hence, the pendulum swings back to a more materialistic attitude toward the concept of disease. With the rise of chemistry and biochemistry, new concepts of disease came alive which are strongly remindful of the Iatrochemist of the 17th century who attempted to explain all physiology and pathology on chemical principles. And with the rise of physics and biophysics, we are again reminded of the Iatrophysicists of the 17th century.

However, there is one branch of medicine which is never able to dispense with the activities of the soul—and that is psychiatry. Stahl, the 18th century founder of vitalism, was also one of the early advocates of psychotherapy. He made striking observations of the effect of the mind upon the body, and his theory of the distraught psyche as a cause of disease contains more than a germ of Freud's teachings.

But even this sketchy outline of the history of the concepts of disease must make it evident that concepts rarely persist too long and that none of them ever remain unchallenged. Thus, even psychiatry, which deals with the psyche, the soul itself, is not left unshaken in its adherence to vitalist thought. Recent events in drug therapy have even brought the study of the treatment of the soul into the realm of the biochemist.

As an historian, I cannot project the history of the future. As a scholar, I cannot even venture to guess what concepts of disease are yet to arise. It is certain, however, that even our increasing knowledge of individual disease and our recognition of disease entities which have been unrecognized during the first two millennia of medical history, will not end the quest for the ultimate concepts of disease.

There will always be a search for an answer to all ills—perhaps in the hope that one day one school of thought will find the one true concept that has power over all disease.

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